

Remarks

The present Response is to the Office Action mailed 06/30/2008. Claims 1-2 are presented for examination.

Claim Objections

2. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because: The title of the invention in the declaration is not the same as the title of the invention given on the first page of the specification. In addition, the declaration fails to claim priority to PCT/EP03/09702 under 35 USC 120.

Applicant's response:

Applicant acknowledges the need for a new declaration, and will provide the same within a reasonable time, as preparation and signature cannot be accomplished within the time frame for this response.

Claim Rejections - 35 USC § 112

3. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

On lines 2-3 of claim 2, the phrase "the lower end" lacks antecedent basis.

Applicant's response:

Applicant herein amends claim 2 to recite "at a lower end", thereby providing antecedence.

Claim Rejections - 35 USC § 103

7. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over GB 1,439,469 in view of Arts et al (EP 1,055,927).

GB 1,439,469 teaches of a method for the pyrolytic analysis of aqueous liquids in order to determine the total oxygen demand (TOD) of the liquids. The method comprises the steps of injecting into a combustion furnace a sample of an aqueous liquid, such as sewage waste water, together with a carrier gas, and heating the sample in the furnace to a temperature from 1000 to 1200°C in the absence of a catalyst. Total oxygen demand is measured by determining the decrease in free oxygen content of the carrier gas during combustion of the sample, and comparing the concentration of free oxygen in the carrier gas both before and after the combustion process. In contrast to conventional furnaces, the combustion furnace taught by the GB patent works in the absence of a catalyst. The high temperature range at which the sample is combusted in the furnace (i.e. 1000-1200°C) ensures that all of the hydrocarbon compounds are completely burnt to form carbon dioxide. See lines 84-90 on page 1, lines 1-26 and 117-122 on page 2, and lines 20-37 on page 3 of GB 1,439,469. The GB patent fails to teach that the combustion chamber is vertically oriented, and that salts in the aqueous sample are removed at the lower end of the combustion chamber.

Arts et al (EP 1,055,927) teach of a method and device for the decomposition of an aqueous liquid sample in order to determine the total content of organic carbon (TOC) therein. The method comprises the steps of passing a sample of aqueous waste water into a combustion chamber that is vertically oriented, and heating the sample to a temperature between 1000 and 1200°C without the presence of a catalyst. Arts et al also teach that any salt components in the sample are removed at the lower end of the vertically oriented combustion chamber. See the abstract, English language translation and Figure 1 of Arts et al.

Based upon a combination of GB 1,439,469 and Arts et al, it would have been obvious to one of ordinary skill in the art at the time of the instant invention to vertically

orient the combustion chamber taught by GB 1,439,469 since Arts et al teach that such a configuration is normally used for the combustion of an aqueous waste water sample, and facilitates the passage of the products of combustion to a detector. It also would have been obvious to one of ordinary skill in the art to remove any salts in the aqueous sample combusted using the method and apparatus taught by GB 1,439,469 at the lower end of the combustion chamber since Arts et al teach that it is advantageous to remove contaminating salts in a combusted aqueous waste water sample so as to achieve accurate detection results.

8. Applicant's arguments filed March 5, 2008 have been fully considered but they are not persuasive.

The objection to the declaration made in the last Office action mailed on September 5, 2007 has been maintained since a new declaration in compliance with 37 CFR 1.67(a) was not received with the response dated March 5, 2008. Most of the grounds of rejection of the claims under 35 USC 112, second paragraph made in the last Office action have been withdrawn with the exception of claim 2, as noted above.

Applicants argue the rejection of the claims under 35 USC 103 as being obvious over GB 1,439,469 in view of Arts et al (EP 1,055,927) by stating that the present claims recite a process of determining the oxygen demand, TOD, of an aqueous solution, whereas EP 1,055,927 teaches a method for determining the total content of organic carbon, TOC, in a solution. Applicants argue that one of skill in the art would not consider a method for determining organic carbon as a method for determining TOD, and therefore, there is no motivation to perform TOD in a vertical chamber. In response to this argument, it is noted that both TOD and TOC analyses are routinely performed in a combustion furnace, and the secondary reference to Arts et al (EP 1,055,927) teaches the advantages of using a vertically-oriented furnace so as to facilitate the passage of combustion products to a detector and the collection of resulting salts at a lower end of the furnace. The primary reference to GB 1,439,469 teaches of the analysis of an aqueous solution for total oxygen demand, and the secondary reference to Arts et al is used solely

for providing evidence that vertical furnaces are extremely common in the field of wastewater analysis performed using a combustion reaction chamber, whether the combustion of the wastewater be for the purpose of determining TOD or TOC. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the instant invention to vertically orient the combustion chamber taught by GB 1,439,469 since Arts et al teach that such a configuration is normally used for the combustion of an aqueous waste water sample, and facilitates the passage of the products of combustion to a detector.

Applicants also argue that the solution in the horizontal chamber of GB 1,439,469 must pass through a heating zone several times to combust the solution, and therefore, the heating process of GB 1,439,469 could not be performed in a vertical chamber, as claimed. In response to this argument, it is noted that if the apparatus taught by GB 1,439,469 were equipped with conventional pumping equipment, a solution could easily be repeatedly passed through a vertically oriented combustion furnace, and the provision of such conventional pumping equipment on a vertical chamber is routine in the art.

For the above reasons, Applicants' arguments are not found persuasive.

Applicant's response:

Applicant herein amends claim 1 to recite, "decomposing sample of the aqueous solution by combustion, without the presence of a catalyst in an upper region of the reaction chamber at a temperature at or above 1200°C."

Applicant argues that GB 1,439,469 teaches using a temperature for decomposing maintained within a region between 1000°C and 1200°C without any further differentiation between temperatures within said region. Applicant points out that GB 1,439,469 specifically teaches away from decomposition at temperatures at or above 1200°C (see col. 3, lines 35-37).

Decomposition at applicant's claimed temperatures is especially advantageous in a method for determining the oxygen demand, (TOD) and (COD) because the unique practical usefulness of implementing such especially high temperatures result in a

extremely reliable analytical result, even without a catalyst. Applicant argues the high temperature also serves to melt and carry out salt components more efficiently. The GB 1,439,469 document makes no teaching or suggestion of removing salt from the chamber in a TOD measuring process.

Additionally, applicant argues that one with skill in the art would not look to Arts' process for TOC to solve such a problem because in the TOC process of Arts it is not suggested that the collection of salts originally dissolved in a sample for decomposition in a TOC measurement process would be particularly advantageous in applicant's claimed TOD measurement process. Additionally, Arts cannot be technically combined with GB 1,439,469 because GB 1,439,469 incorporates and provides procedures for a horizontal chamber. One with skill in the art is aware that mechanical and periodical cleaning procedures are performed for cleaning salt from horizontal chambers.

Applicant argues that it is questionable that the imagined result espoused by the Examiner as a result of combining GB 1,439,469 and Arts would/could provide the same result as the TOD process claimed in applicant's invention. Applicant argues that it is entirely possible that the motivation required to make the combination lays entirely in the Examiner's hindsight knowledge of applicant's invention. Applicant points out that applicant's claimed temperature at or above 1200°C *and* the orientation of the furnace, as argued, negate proper motivation for one with skill in the art to achieve applicant's TOD process, as claimed.

Applicant argues that it is a non-obvious idea to look for another way to remove salts in a horizontal chamber because it is known that salts are removed from a horizontal chamber in a periodic mechanical process via a salt trap. Applicant argues that even considering the combination of GB 1,439,469 with Arts, there are many obstacles to combining one piece of art with a horizontal combustion chamber, both pieces of art which fail to teach or suggest the high combustion temperature, as claimed and one piece of art not teaching or suggesting TOD measurements. It would not have been obvious to incorporate Arts into GB 1,439,469 which teaches a horizontal chamber. It would not have been obvious to incorporate GB 1,439,469 into Arts, which fails to teach TOD, and

neither piece of art teaches combustion at high temperatures, as claimed. Applicant argues that there would be many difficult modifications which would have to be made to the art to incorporate the combination of GB 1,439,469 and Arts to render applicant's claimed invention that would not be considered by one with skill in the art and is not considered by this Examiner.

Therefore, applicant believes claims 1 and 2 are easily patentable over the art of GB 1,439,469 and Arts, either singly or in combination.

Summary

As all of the claims, as amended and argued above, have been shown to be patentable over the art presented by the Examiner, applicant respectfully requests reconsideration and the case be passed quickly to issue.

If any fees are due beyond fees paid with this amendment, authorization is made to deduct those fees from deposit account 50-0534. If any time extension is needed beyond any extension requested with this amendment, such extension is hereby requested.

Respectfully Submitted,
Werner Arts et al.

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